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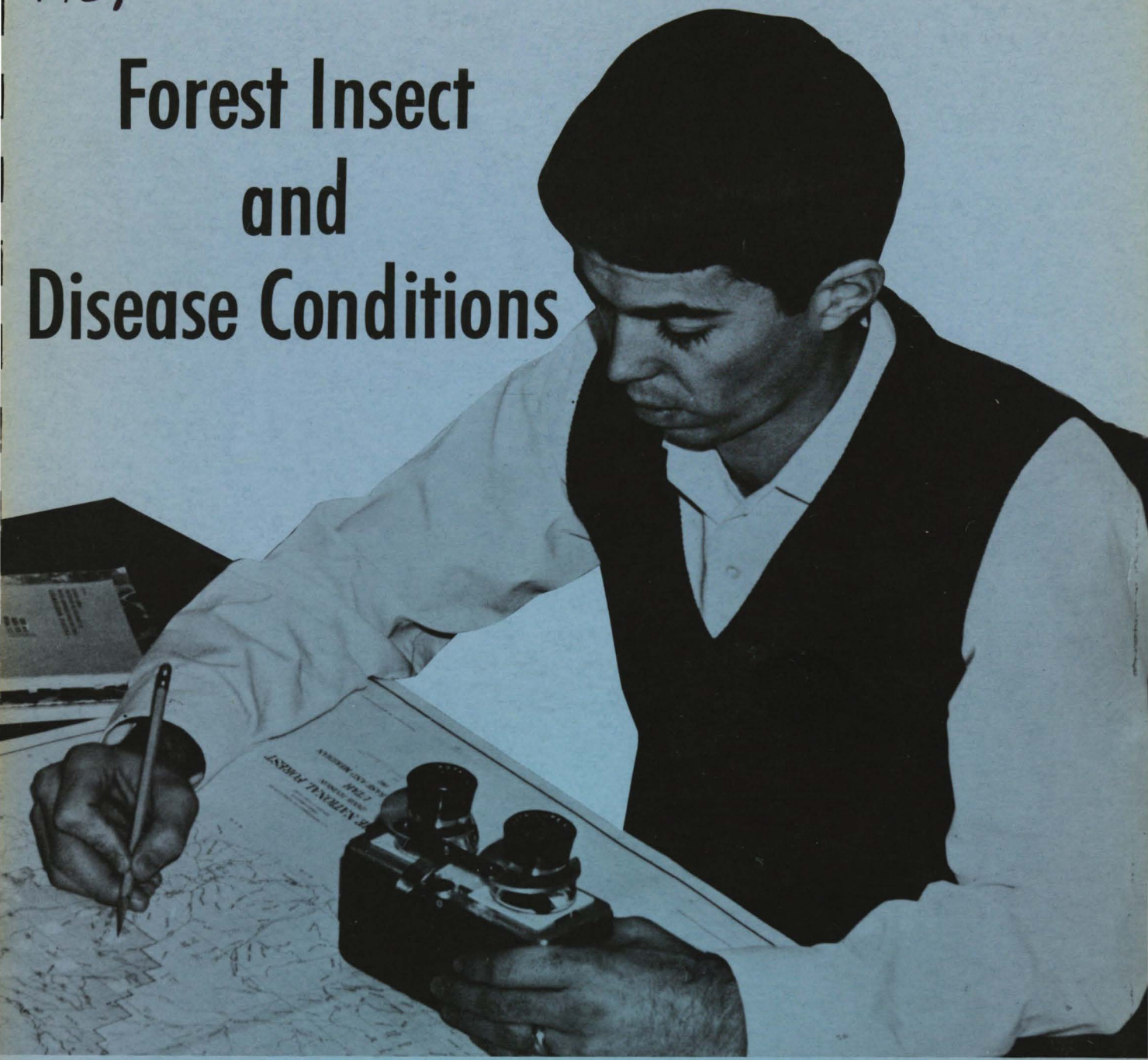
Forest Insect and Disease Conditions



in the Intermountain States during 1968

BRANCH OF FOREST INSECT AND DISEASE PREVENTION AND CONTROL
DIVISION OF TIMBER MANAGEMENT
REGION FOUR / FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE
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COVER STORY

Entomologists in the Intermountain Region have long felt the need for aerial photography that is simple, inexpensive, and within their technical capabilities. Additionally, and most important, the system had to be versatile enough so that it could be effectively used in conjunction with the aerial detection survey. Of the various photographic systems available, 35-mm was the system that best fit these criteria. Armed with nothing more than a 35-mm camera it is possible to produce high quality three dimensional color transparencies and prints from the air. One of several existing methods for viewing the small format (35 - 70-mm) transparencies is with this portable stereo viewer shown here. Plans are to further develop this mini-aerial photographic system not only for use by entomologists but for foresters and other land managers as well.

FOREST INSECT & DISEASE CONDITIONS IN THE INTERMOUNTAIN STATES DURING 1968

By

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May 1969

Branch of Forest Insect and Disease Prevention and Control

Division of Timber Management

Region Four Forest Service

U.S. Department of Agriculture

Ogden, Utah

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RESUMÉ OF CONDITIONS

The principal insect enemies that have long plagued the Forests of the Intermountain Region caused losses again in 1968. Of major concern is the mountain pine beetle, which has continued to deplete lodgepole stands throughout southern Idaho, western Wyoming, and northern Utah. Persistent control efforts on the Targhee National Forest have been offset by residual populations of beetles sufficient enough to perpetuate the insect problem. The beetle has declined considerably on the Rexburg and Spencer Districts, continues over much of the Island Park country, and is increasing on those portions of the Forest adjacent to Yellowstone and Grand Teton National Parks. The once serious Teton infestation, for the most part, continues to decline. Conditions on the Bridger National Forest, conversely, show evidence of increasing at the lower elevations of the Wyoming Wind River Range. Scattered but repeated tree killing is still prevalent on the Caribou and Cache National Forests.

The Douglas-fir beetle caused tree losses at various locations in the Region. Damage is usually localized, often in inoperable areas.

A widespread, simultaneous rise in spruce beetle occurrence was observed in the Region this year. Although beetle damage is, for the most part, at a low level, population trends are being closely evaluated in the event that more devastating infestations might follow.

The western pine beetle continues to cause localized attrition of ponderosa pine in north central Idaho and southern Utah. Pine engraver beetles subsided, causing losses in only certain locales. Recreational areas of the Toiyabe National Forest suffered additional attrition of mature ponderosa pine caused by the roundheaded pine beetle.

After a 1967 low ebb in spruce budworm activity, defoliation showed renewed impetus over much of the Region this summer. The greatest activity is in two buildups, one on the Payette National Forest and the other on the contiguous Targhee, Teton, Bridger, and Caribou National Forests. Egg mass counts indicate even greater activity in 1969. The sugar pine tortrix continues its sporadic defoliation of lodgepole pine in portions of the Targhee and Teton Forests as well as in Teton Park. The Region-wide tent caterpillar populations of 1966 and 1967 continue to defoliate range plants and broad-leaved trees but at reduced levels.

A more complete discussion of these and other insects and diseases follows. This summary has been compiled from detailed evaluations prepared by our Regional entomologists and pathologist. Much contributing information was a direct result of field reports by Forest personnel.

BARK BEETLES

Mountain pine beetle, Dendroctonus ponderosae Hopk.

Lodgepole pine

The mountain pine beetle has traditionally caused concern in the Intermountain Region. There have been persistent population outbreaks and subsequent declines. The beetle is indigenous to many of the Region's Forests and beetle-caused mortality is an inherent aspect of lodgepole pine silviculture and management. Such a native insect has not and is not likely to decimate lodgepole pine. Persistent beetle outbreaks can result in rather drastic reductions in average stand diameters, highly nonselective stand thinning, and conversion of stand composition. The land manager is, in cases of extensive and enduring outbreaks, confronted with a complex decision whereby he must thoroughly evaluate (1) the possible insect trends, (2) the effectiveness of current treatment methods, (3) the level of tree mortality that he can tolerate, and (4) the short- and long-term effects of tree mortality on one or more land uses and resource values.

The dynamic patterns of lodgepole pine mortality were displayed once again in 1968. Of primary interest is the huge infestation on the Targhee Forest in eastern Idaho and western Wyoming where more than 400,000 standing trees were sprayed with ethylene dibromide and an additional 36,000 infested trees were logged. Within the suppression area, the greatest population increase was from the Cave Falls Road north to the Moose Creek Plateau along the Yellowstone Park boundary. Significant pine mortality also extends west across the southern portion of the treating area. The west portion of the main infestation has undergone a definite decline in tree mortality. Much of that timber is of mixed composition and has been extensively logged. The present treating area is currently set up for a more integrated beetle treatment program in which chemical treatment would augment accelerated logging of susceptible lodgepole stands ahead of the brunt of the infestation. The rapidly increasing untreated infestation in adjacent Yellowstone Park will have a marked influence on the control area.

South of the control area where treatment was terminated in 1967, a different condition exists. From Cave Falls Road south to the North Fork of the Teton River, evaluation samples indicate that more trees were attacked in 1968 than in all recent years combined. Farther south, along the McRenold Reservoir road, there is approximately one new attack for every one occurring in 1967. The actual numbers of attacks are relatively high. Under this condition, appreciable mortality can accumulate even though the insect population is killing trees at a constant or static rate. Cutting on a timber sale of approximately 25 MM board feet was begun in 1968 and has progressed quite rapidly. The harvest has effectively utilized many sawtimber-size lodgepole pine that would otherwise succumb to the beetle in the near

future. In addition to the utilization of threatened timber, logging has destroyed broods in the trees cut prior to flight. However, the main benefits from logging have been the utilization of threatened timber and the conversion of highly susceptible stands to areas of young growth. A similar situation prevails in many drainages to the south. The degree of tree killing observed at lower elevations in 1967 is now evident at higher elevations. Presumably, buildups within upper drainages were accompanied, to some degree, by flights from lower, more established populations.

Tree mortality has also increased in the vicinity of North Fork Pine Creek, West Pine Creek, and Mike Spencer Canyon. On most of the Rexburg Ranger District, a formerly severe infestation continues to decline. Only some lower portions of the drainages support a lingering number of faders. It is noteworthy that some stands such as the one around Moody Swamp consist of residual sawlog and pole-size lodgepole pine. Such stands are in contrast to surrounding timber which underwent severe depletion in recent years. This situation points up the fact that although heavily infested areas containing large numbers of "red tops" appear to be complete losses, residual stands of some live trees will remain. In some cases, the residual stand may consist of a fairly desirable range of size classes.

The declining trend of mountain pine beetle that was reported on the Teton Forest and Grand Teton Park in western Wyoming in 1967, continued in 1968. Aside from localized areas of population buildup, the overall situation is encouraging both on the Forest and in the Park. On the Forest, 1,982 infested standing trees were chemically treated, 17,895 were felled and burned, and about 850 were logged prior to adult emergence. The 1968 aerial survey results were similar in extent and distribution to those found in 1967. Tree mortality over most areas continued to decline far below the high levels reached in 1965. On the Forest north of the Buffalo Fork, most of the active mountain pine beetle tree killing persists in the upper drainages of the Teton Wilderness. Except for additional tree mortality in such upper drainages, the untreated infestation in the Wilderness continues to decline due to natural causes. South of the Buffalo Fork, some tree mortality occurred, but basically these stands contain only widely scattered attacks. The Hoback River country has generally undergone a decline in infestation level. There are, however, examples of some beetle buildup. Granite Creek and Cliff Creek are such exceptions.

In Grand Teton Park, an overall reduction in pine mortality was apparent with the exception of the area around Whitegrass Ranger Station and Phelps Lake. That area is undergoing a localized resurgence of beetle activity. To better assess the future hazard due to beetle buildup on the Forest or in the Park, it is well to consider as high risk those areas where residual large diameter trees remain. As long as this source exists, such stands remain attractive to attacking beetles.

Lodgepole pine on the Forest east of Antelope Flat, although in mixture with other species, does consist of susceptible size classes. Although control efforts in Grand Teton Park have exerted an effect on the insect population, many vulnerable trees still exist. Lodgepole pine "faders" or red-topped trees are expected to persist in these susceptible stands until trees of the most susceptible size classes are depleted through annual natural attrition or the current beetle infestation finally recedes.

In 1967, evaluation data portended a reduction in pine mortality on the Wyoming Division of the Bridger Forest in western Wyoming. The prediction was partially incorrect. Mortality occurred over a more extensive area of the Division in 1968. The Little Greys River, Deadman Creek, Blind Bull Creek, and Park Creek on the Greys River supported the most serious beetle buildup.

Tree killing will likely continue to increase in the upper Little Greys River drainage as long as trees of susceptible size remain. Continued stand depletion continues along the Greys River. The only serious infestation on the east side of the Division is in the North and South Forks of Middle Beaver Creek. That outbreak has, however, leveled off. In nearby Bureau of Land Management stands, tree mortality has decreased steadily for two years; however, approximately 5,000 trees were still killed this past summer.

The Bridger Division of the Bridger Forest supported a continued high level of tree mortality. Peripheral stands along the lower western boundary have been depleted to the extent that only small diameter trees remain abundant. Sizeable population increases in 1968 exist in the vicinity of New Fork Lakes, Willow Lake, Fremont Lake, Half Moon Lake, and Burnt Lake. A decline in insect activity was observed at the northwest end of the Division. Preliminary plans are being made for the harvest of some 16 MM board feet of lodgepole pine in and near the buildup areas. While not an insect control effort, per se, the harvest is expected to utilize at least some merchantable timber that could otherwise be destroyed by the mountain pine beetle. The logging will be coordinated with limited chemical treatment.

Extensive, scattered mortality of lodgepole pine continued on the Ketchum and Fairfield Ranger Districts of Idaho's Sawtooth National Forest in southern Idaho. Biological evaluation results indicate increasing losses in 1969.

Scattered mountain pine beetle activity persists on the Caribou Forest in eastern Idaho with particularly noticeable increases at the northwest end of the Forest and in the centrally located Diamond Flat area. Most beetle-caused mortality was concentrated along the eastern half of the Idaho portion of the Forest. On the Cache Forest in Idaho and northern Utah, increased tree killing occurred in areas where decreases were predicted. Examples are one 3,000 tree group in Eight Mile Creek

and 1,500 trees scattered throughout portions of North and Immigration Canyons and Copenhagen Basin. Elsewhere on the Cache Forest, widely scattered beetle attacks continued at about the same level as in 1967.

On the Ashley and Wasatch National Forests in southwestern Wyoming and northern Utah, tree killing was practically nonexistent in 1967. One exception, however, is near Flaming Gorge on the Ashley Forest where widely dispersed mortality showed an upsurge.

Ponderosa pine

The mountain pine beetle inflicted losses in ponderosa pine at various locations within the Region. The persistent infestation in second-growth ponderosa pine stands on state and private lands southeast of Cascade, Idaho, continued unabated. Aerial surveys revealed that approximately 12,000 trees were killed last year with attacks concentrated in smaller diameter trees; control is contemplated. A continuing condition is expected in 1969. Two small epicenters in ponderosa and lodgepole pine exist on non-Forest lands east and south of McCall. The state of Idaho has conducted some direct control work in the area to the south.

Widely scattered killing of ponderosa pine increased over that recorded last year in and adjacent to the newly created Flaming Gorge National Recreation Area on the Ashley Forest. Tree killing is expected to continue at about the same rate in 1969. A similar, but more localized, condition prevails in Uinta Canyon of the Roosevelt Ranger District.

In the southern part of the Region, ponderosa pine mortality continues at a slow but persistent rate along the upper East Fork of the Sevier River on the Dixie National Forest and in adjacent Bryce Canyon National Park in southern Utah. At this time, the bulk of mortality is occurring in the Park where esthetic values are threatened.

Douglas-fir beetle, Dendroctonus pseudotsugae Hopk.

Douglas-fir beetle outbreaks have occurred periodically in southern Idaho. Extensive windthrow and snow breakage in the winter of 1964-1965 precipitated subsequent beetle buildups. Annual increases in tree killing have occurred since that time. Salvage logging, and felling and burning of infested trees caused a marked reduction in Douglas-fir mortality in the Bogus Basin Ski Area near Boise. Other epicenters on the Boise National Forest in southwestern Idaho are expected to continue unless natural factors intervene. The Fairfield and Shake Creek Districts of the Sawtooth Forest experienced approximately 50 new infestation centers of from three to twenty attacked trees per group. The widespread upward trend in Douglas-fir beetle on the Forest can be curtailed only by timely and well planned slash disposal combined with salvage logging wherever feasible and practical.

In central Idaho, the Payette Forest currently has beetle-infested timber scattered throughout the Idaho Primitive Area, along the South Fork of the Salmon River, and in the southwest corner of the Forest. Tree killing on the Challis National Forest was typified by widely scattered 3- to 10-tree groups. The main portion of the Salmon National Forest also supports scattered "spots" of beetle damage. The greatest frequency of group killing is in the northwest part of the Forest where groups of 20 or more new attacks are common. Corn Creek alone supported about 500 new attacks. In the Wyoming Division of the Bridger Forest, the only significant mortality was in the northwest corner. Because of the widely scattered nature of most of these infestations, the relatively low volumes per area, and generally inoperable and inaccessible conditions, control is not practical. The only alternative is to attempt to combine the larger tree groups with current logging operations wherever possible.

Engelmann spruce beetle, Dendroctonus obesus Mann.

There is an apparent increase in spruce beetle-caused mortality over much of the Region. In most cases, the damage has so far been localized but nevertheless obvious. Spruce mortality on the Teton Forest was evident in certain tributaries of Cliff Creek, at the head of Cabin Creek, in North Fall Creek, Mosquito Creek, and Buck Creek. Groups of

These Engelmann spruce logs attracted adult spruce beetles. Timely removal will prevent the resulting broods from attacking nearby standing timber.

20 to 50 recently attacked spruce were aerially detected in Owl, Berry, and Hechtman Creeks of Grand Teton Park.

A similar situation prevails in the southwest corner of the Targhee Forest. Beetle-killed Engelmann spruce were found in groups of from 10 to 30. A few groups were found between Mike Spencer Canyon and Upper Palisade Lake, but most of them are located from Moose Creek southeasterly along the Snake River Range to Cabin Creek. The Wyoming Division of the Bridger Forest supported widely scattered spruce beetle activity. Of greatest concern are the North Fork of Dry Beaver Creek and the South Fork of North Horse Creek. An increase in mortality was also noted in the upper Green River drainage. The causes of this increased beetle activity are not fully understood, but it appears to correlate with increased beetle activity in other western Regions. Due to the widespread nature of the many infestation centers, control does not appear to be practical at present. The incipient buildup is expected to continue or possibly increase in 1969 and will be closely monitored.

The recent increase in spruce beetle activity in the Region is epitomized by the Hilgard Mountain area on the Fishlake National Forest in southern Utah, which is now distributed over several square miles. The most significant increase occurred in that area. The beetle situation was precipitated by blowdowns occurring several years ago. In essence, there has been a condition of annual spruce attrition caused by repeated generations of beetles. Although the annual mortality has not increased drastically, it has become more intense and extensive. Inaccessability and inoperable conditions limit salvage logging.

The Aquarius Plateau - Boulder Mountain area of the Dixie Forest has historically supported severe spruce beetle damage. Many snags remain as reminders of a past epidemic. Since the insect normally builds up in windfalls or logging debris, it is essential that timely slash disposal measures be taken. In Coyote Hollow, 3 MM board feet of logs are to be removed as early as possible in 1969 to prevent an almost inevitable population increase. A large timber sale area, near Navajo Lake, has been partially harvested and broadcast burned. Fire-scorched perimeter trees will be examined in 1969 for the incidence of beetle attacks. Also under surveillance are about four acres of complete blowdown on the Circleville District.

Epidemic populations of spruce beetle resulting from right-of-way construction near Hazard Lake on the Payette Forest were successfully regulated by trap trees felled in the spring of 1968. Any residual beetle population is expected to be absorbed by a 12 MM board feet sale in 1969.

The recent ebb in spruce beetle activity on the Uinta National Forest shows a slight resurgence. Most beetle-killed trees are on the Heber

and Strawberry Ranger Districts. Removal of some of the infested trees and proper handling of logging slash have adequately deterred the beetle so far.

By nature of the beetle's habits, it is difficult to assess future infestation trends. It is possible, however, that mortality in many areas might continue on at least the same level next year.

Western pine beetle, Dendroctonus brevicomis Lec.

Ponderosa pine stands in the Pine Valley Mountains of the Dixie Forest continue to sustain scattered group-killing. Dying pine in isolated patches have been removed from recreational areas prior to brood emergence. The mountain pine beetle damage to ponderosa pine near McCall, Idaho, and in Laffinwell Creek, Payette Forest, has been compounded by attacks by the western pine beetle. A similar bark beetle complex was observed in the large epidemic near Cascade, and in a small, widely separated outbreak in Grouse Creek, on the Sawtooth Forest.

Pine engravers, Ips spp.

Ideal climatological conditions, coupled with the availability of spring logging slash, sustained tree killing by engraver beetles in second-growth ponderosa pine on the Emmett, Idaho City, Garden Valley, and Cottonwood Ranger Districts of the Boise Forest. Mistblown applications of lindane to tractor-piled slash have been recommended wherever possible. A significant reduction in engraver attacks of ponderosa pine was observed on the Payette Forest and on the Shake Creek Ranger District of the Sawtooth Forest. With timely logging and thinning practices, this downward trend should continue through 1969.

Roundheaded pine beetle, Dendroctonus adjunctus Blandford

A bark beetle complex, consisting primarily of the roundheaded pine beetle, continued to deplete mature and overmature ponderosa pine in the Spring Mountains of the Las Vegas Ranger District, Toiyabe Forest in southern Nevada. Although the infestation is fairly widespread, control is planned only in Lee and Kyle Canyons, two intensively used recreation and homesite areas. During the winter of 1968-1969 approximately 450 infested trees will be felled and burned while some 550 trees will be logged. An additional estimated 300 trees may be treated or logged from enclosed private lands.

AUGUST 1948

AUGUST 1968

Engelmann spruce killed about 1923 in the Aquarius Plateau-Boulder Mountain spruce beetle outbreak.

(Purple Lake, Dixie National Forest)

DEFOLIATORS

Spruce budworm, Choristoneura fumiferana complex

The spruce budworm situation in the Region that peaked in 1964 but dropped to a low level in 1967 shows evidence of a general resurgence. Host trees are Douglas-fir, subalpine fir, and Engelmann spruce. A breakdown of budworm infested acreage for the last seven years follows:

Year	Defoliation Intensity			
	Light (Acres)	Moderate (Acres)	Heavy (Acres)	Total (Acres)
1962	480,000	373,000	788,000	1,641,000
1963	357,800	276,600	988,800	1,623,200
1964	266,000	658,000	1,352,000	2,276,000
1965	465,600	254,500	795,200	1,515,300
1966	923,900	52,200	16,100	992,200
1967	162,200	54,900	1,600	218,700
1968	333,500	150,200	21,800	505,500

The largest increase in the Region was on the Payette Forest. The Teton, Targhee, Bridger, and Caribou Forests share a common budworm outbreak totaling 132,660 acres. Significant defoliation occurred in 1968 at the northern end of the Wyoming Division of the Bridger Forest. That part of the infestation extended from Sheep Creek on the south to the Grand Canyon of the Snake River on the north, and from Alpine Junction on the west to the Forest boundary on the east. Most defoliation on the Targhee Forest extended from Cottonwood Creek east along the Snake River to Pole Canyon and north into Dog Creek. On the Teton Forest, the budworm caused observable tree browning in Horse Creek, along the Snake River south of Hot Springs, and in nearby Fall Creek. Budworm activity on the Caribou Forest portion of the infestation was concentrated along the west side of Palisades Reservoir.

Approximately 360 acres of defoliation occurred on the Ashley Forest in 1968. Large concentrations of previously light defoliation occurred on the Salmon Forest, particularly in the northeast, central and southwest portions. Additional damage was observed southwest of Salmon, Idaho.

Defoliation increased in both intensity and extent on portions of the Payette, Boise, Challis, and Sawtooth Forests. On the Payette Forest which supported the greatest single outbreak in Idaho, defoliation occurred on over 221,000 acres. The relatively persistent infestation in Big Creek increased in severity while new scattered activity showed up on both sides of the Salmon River. Heavier feeding damage also occurred along the northern edge of the Forest. An analysis of egg mass

data indicates even greater activity in 1969. There is a possibility of increasing damage to Douglas-fir and true firs. The focal point of attention on the Boise Forest was defoliation in Marble Creek in the Primitive Area. The budworm resurgence on the Challis Forest resulted in a 17,000 acre infestation near Scarface Mountain. There was defoliation at several locations on the Sawtooth Forest. Conditions in the Region during 1968 are tabulated as follows:

Defoliation Intensity

Forest	Light (Acres)	Moderate (Acres)	Heavy (Acres)	Total (Acres)
Ashley	400	--	--	400
Boise	12,400	11,600	3,700	27,700
Bridger	33,300	53,000	8,900	95,200
Caribou	5,000	500	500	6,000
Challis	33,300	--	--	33,300
Payette	146,400	69,500	5,700	221,600
Salmon	42,700	300	--	43,000
Sawtooth	46,700	--	--	46,700
Targhee	4,300	9,700	3,000	17,000
Teton	9,000	5,600	--	14,600
	333,500	150,200	21,800	505,500

Characteristic terminal defoliation of lodgepole pine caused by sugar pine tortrix.

The causes of the current upswing in defoliation are not entirely known, but egg mass collections throughout the Region indicate further damage to host species in 1969.

Sugar pine tortrix,
Choristoneura lambertiana (Busck)

This defoliator has consistently defoliated the new foliage of understory and open grown lodgepole pine in many areas of southeastern Idaho and western Wyoming. Light feeding damage is inconspicuous from the air, and ground evaluations are often necessary to assess the host damage. It is suspected that long-term damage takes the form of radial increment loss and branch deformity in trees of low vigor or which grow on poor sites. Tree mortality is yet to be observed and damage is not currently serious enough to justify control.

Feeding damage was distributed rather widely over portions of the Targhee Forest with scattered activity recorded in the Fall Creek - Mosquito Creek areas of the Teton Forest. Heavy defoliation was discernible from the air around Red Top Meadows, the North and South Forks of Fall Creek and in Taylor, Cottonwood, and Mosquito Creeks to the north. In Grand Teton Park, moderate defoliation occurred between Jenny Lake and Signal Mountain.

Tent caterpillars, Malacosoma spp.

Range plants, principally bitterbrush, suffered above normal tent caterpillar defoliation on the Fishlake, Cache, and Boise Forests. Although populations do not display any predictable cycles, they periodically reach high levels at scattered locations. During intervening endemic years, they can usually be found feeding in low numbers. Colonial in habit, their tents can occassionally be seen even in very light infestations. The 2- to 3-year old outbreak on the Fishlake Forest has subsided considerably. Localized bitterbrush feeding prevailed near Logan, Utah, and scattered, moderate defoliation occurred in Cottonwood Creek on the Boise Forest.

Populations of another tent caterpillar, Malacosoma incurvum discoloratum (Neumoegen) were sufficiently high to cause moderate localized defoliation of Fremont cottonwood in Zion National Park and along the Virgin River in southern Utah. In the Park, larvae were significantly reduced by mistblower applications of Bacillus thuringiensis. Egg samples indicated a similar infestation level in 1969 resulting from a residual overwintering population.

Late-instar looper larvae can rapidly defoliate Gambel oak.

Chokecherry and big-tooth maple were defoliated by the forest tent caterpillar, M. disstria Hbn., in one area on the Cache Forest, Utah.

A looper, Lambdina punctata (Hulst)

Little biological information is available describing the habits of this species. The 1968 aerial survey indicated approximately 2,500 acres of defoliation to Gambel oak along the Wasatch Front from Provo to American Fork. Twelve hundred acres of light to heavy defoliation were recorded in Pole Canyon, 1,000 acres of medium to heavy feeding in Battle Creek, and 300 acres of medium defoliation in Heisetts

Hollow. Severe defoliation surrounded the Timpanogos Archery Range. The peak of larval feeding was reached in mid-July; moths flew in early August. Completely defoliated oak brush had refoliated by late summer. Although unknown at this time, it is very possible that natural mortality factors will reduce the insect population to a low level in 1969.

White fir needle miner, Epinotia meritana Hein.

The generally endemic needle miner populations of 1967 declined somewhat further this year on the Dixie Forest and in adjacent Bryce Canyon Park. Light defoliation occurred on 1,280 acres in 1967 and on only 520 acres in 1968. One exception is a buildup at the head of Coyote Hollow. The damage, however, is localized and defoliation is only light to moderate. Very limited defoliation of white fir occurred throughout Cougar Hollow and adjacent to the southwestern end of the Park. No control is considered necessary.

A white fir defoliator, Argyrotaenia dorsalana (Dyar)

This incidental defoliator was observed feeding in conjunction with the white fir needle miner on white fir in Bryce Canyon Park and the Dixie Forest. Larvae characteristically bundle or tie developing needles. An active individual larva could be found in each needle cluster. The insect pupated early and did not seriously defoliate host trees.

A tussock moth, Hemerocampa sp.

The anticipated buildup of this defoliator in the Town Creek Plantation on the Boise Forest materialized in 1968. Ceanothus, bitterbrush, and willow foliage was consumed by larvae as rapidly as it grew. As food grew scarce, the ravenous larvae moved onto young ponderosa pine and began to feed. Some oviposition occurred on the pines although ceanothus was thought to be the preferred egg laying site. The question is now whether the emerging larvae will feed principally on their overwintering pine host or on their primary food plants.

OTHER INSECTS

A spruce mealybug, Puto sandini Washburn

The historic mealybug infestation on Engelmann spruce on the Fishlake Forest persists. Past feeding damage is easily observed in one area on Thousand Lake Mountain. Although mortality has not been recorded, branch killing is suspected. A low but persistent population exists in high elevation spruce stands on Barney and Griffin Tops of the Dixie Forest.

A lodgepole pine terminal weevil, Pissodes sp.

Lodgepole pine reproduction in clearcut areas is subject to insects such as this terminal weevil of the genus Pissodes.

Terminal damage by this insect to lodgepole pine reproduction in Sawtooth Valley and south of Galena Summit on the Sawtooth Forest was again detected in 1968. The heaviest damage occurred between Alturas and Pettit Lakes. At this time control is not considered appropriate.

A pine seedworm, Laspeyresia sp.

Entomologists studied two insects infesting second-year ponderosa pine cones collected from the Crooked River cone collection area of the Payette Forest. Representative cones were collected and then dried in the laboratory. Subsequent cone dissections revealed that the most prevalent insect was a pine seedworm of the genus Laspeyresia. A less frequent gall midge of the family Cecidomyiidae was also found. The seedworm was recorded in 85 percent of 250 cones examined, and the gall midge was found in 3 percent of the same cones. Despite the high incidence of infested cones, the percentage seed loss was less. All factors considered, 69 percent of the seed was sound.

Grass plant bug, Labops hesperius Uhler

The recent problem caused by this insect on crested wheatgrass persists. In 1968, 5,000 acres of rangeland on the East Fork, Sevier River, Dixie Forest, were treated by aerial spraying. A formulation of 6 ounces of Malathion per acre was applied along streams and an 8-ounce dosage was used elsewhere. The project was directed by the Agricultural Research Service.

Miscellaneous defoliators and bark beetles

The black-headed budworm, Acleris variana (Fern.), together with the spruce budworm, continued to defoliate Douglas-fir in an isolated outbreak on the Caribou Forest, near Montpelier, Idaho. A pinyon sawfly,

Neodiprion edulicolus Ross, population in southeastern Nevada has dropped to a very low level due to natural factors. Fir engravers, Scolytus ventralis Lec. and Dryocoetes confusus Sw., remained endemic for the second straight year. A defoliator of mountain mahogany, Anacamptodes clivinaria (Guenée), remained at a low level for the second consecutive year in Owyhee County, Idaho. The pinyon needle scale, Matsucoccus acalyptus Herb., continued to defoliate pinyon in localized outbreaks in southern Utah.

FOREST DISEASES

By Alfred C. Tegethoff

Fomes annosus root rot

Two areas of F. annosus infection were found in the Jordan Pines Campground in Big Cottonwood Canyon, Wasatch Forest, infecting subalpine fir. Extensive kill has occurred in both areas. Two other areas of infection were found adjacent to the Brighton Ski Area, Big Cottonwood Canyon, also in subalpine fir. An undetermined number of possible infection areas were noted from the air on the Mountain Empire Ski Area, Big Cottonwood Canyon. Two centers were ground checked and F. annosus positively identified, again in subalpine fir.

On the Little Butte area of the Targhee Forest, F. annosus was found killing lodgepole pine. All age classes from reproduction to sawtimber were dying.

On the east slope of Boulder Mountain, Dixie Forest, areas of root rot kill caused by F. annosus, Armillaria mellea, and combinations of both were found. At least five centers were found in a very short period of time. Five to twenty dead trees were present in each center. The area had been logged in 1954.

Fomes annosus infection center in subalpine fir. Wasatch Forest.

If the ease with which F. annosus is being found is any indication of its prevalence, there should be much concern among land managers about the losses this fungus can cause. There now exist many sources of inoculum throughout the Region. Since the fungus gains entrance to the root systems through freshly cut stumps, any tree cutting activity is a potential threat to the remaining stand. Losses are particularly severe in reproduction. Land managers should be considering control (by prevention) of this problem. Stump treatment with "Borax" takes seconds per stump and is very inexpensive.

Mortality of ornamental spruces

Numerous inquiries concerning dieback of ornamental spruces have been received during the last two years, In all cases except one, the tree roots were growing through a heavy sod. In one case heavy pedestrian traffic around the trees was evident. No insect or disease activity was visible. In all cases it was concluded that the trees were not receiving adequate water due to the water holding and transpirational capacity of the sod, or because of runoff caused by soil compaction.

Recommended treatment was to punch holes approximately 12 inches deep in the soil with a crowbar, one hole to each three sq. ft. of area to a distance of 10 ft. beyond the drip line of the crown. The area should then be watered heavily at least once a week year round. If traffic is heavy around such trees, holes may have to be reopened each year. Sod should also be cut from around the base of the trunk and a shallow basin at least 10 feet in diameter constructed around the trunk.

Bark cracking of lodgepole pine, cause unknown

Bark cracking with an associated resinosis was noted on the east side of the Targhee Forest a few miles from the Yellowstone border. The condition is associated with high elevation areas. Cracking is confined to approximately the lower two feet of the trunk with the whole circumference involved. Cracks do not reach the cambium, which appears normal. A black fungus is found around the edges of the cracked bark plates. No work has been done on this condition beyond location and cursory examination.

Dwarfmistletoe, Arceuthobium spp.

Another series of dwarfmistletoe chemical control plots were established this year in ponderosa and Jeffrey pine, and Douglas-fir. Results as of November 1968 appear promising. Further tests will be established this year which will include lodgepole pine.

State of Idaho personnel are proposing a cooperative dwarfmistletoe control project on 400 acres of state land near Horseshoe Bend. The principal host species involved is Douglas-fir.

DISTRIBUTION OF MAJOR FOREST INSECT INFESTATIONS IN REGION 4

1968

LEGEND

- *Mountain Pine Beetle*
- *Douglas-fir Beetle*
- *Engelmann Spruce Beetle*
- *Spruce Budworm*

Based on aerial and ground surveys

DIVISION OF TIMBER MANAGEMENT

FOREST SERVICE

U. S. DEPARTMENT OF AGRICULTURE

SCALE *miles* 0 40

RELIEF MAP
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